

September 15, 2017

Mr. Anthony Krone Risk Manager Shelby County Schools 160 South Hollywood – Room 152 Memphis, Tennessee 38112

RE: Lead in Drinking Water Sampling
Westwood High School
4480 Westmont Road
Memphis, Tennessee
Tioga Project No.: 24816.01

Dear Mr. Krone,

At the request of Shelby County Schools (the Client), Tioga Environmental Consultants (Tioga) performed sampling of drinking water sources at Westwood High School for laboratory analysis of total lead concentrations.

As preliminary sampling of select water sources at this school revealed the potential for elevated lead levels in the potable water system, Tioga recommended additional sampling of all water fountains in the school to determine the extent of the issue. Following the receipt of the laboratory analytical results from the initial sampling event, Tioga informed Shelby County Schools Risk Management personnel, who instructed maintenance personnel to take the water fountains at this school out of service pending further testing.

Prior to this additional sampling event, the water fountains throughout the school had been shut off for approximately four days. Sampling was conducted early in the morning, before any potable water sources had been used for the day and prior to the arrival of any students or faculty. Maintenance personnel reactivated the water fountains immediately prior to sampling, and the water fountains were deactivated and taken out of service immediately following the sampling.

On September 12, 2017, Tioga representative Luke Hall arrived onsite and was escorted through the building by Shelby County Schools personnel. First-draw potable water samples were collected in accordance with the Environmental Protection Agency (EPA) regulations codified in 40 CFR 141.86, and were documented and transferred under chain-of-custody protocol to Waypoint Analytical Laboratories in Memphis, Tennessee for analysis of total lead content.

The EPA has established an action level for public water supply systems at 15 micrograms of lead per liter of water (15  $\mu$ g/L). The further EPA recommends that schools remove water fountains and other outlets used for consumption if lead levels exceed 20  $\mu$ g/L. Though this school uses water from the municipal water supply and therefore does not qualify as a public water supply system, Tioga recommends that the more conservative EPA action level of 15  $\mu$ g/L be used in the decision making process as to the continued operation of the potable water sources at the school.

### **Results Based on Laboratory Analysis:**

Table 1 below summarizes the sampling locations, laboratory analytical results, and EPA action level for lead in drinking water. Sample results with a "<" symbol did not contain lead content above the laboratory detection limit. Samples highlighted in yellow exceeded the EPA action level for lead.

Table 1
Summary of Analytical Results
Westwood High School
September 12, 2017

Sample ID	Sample Location	Total Lead (µg/L)	EPA Action Level (µg/L)
32-1	White Water Fountain Across from Art Room	658	
32-2	Gray Water Fountain Across from Art Room	2.53	
32-3	Water Fountain Across from Room 218	9.74	
32-4	Water Fountain Across from Room 213	20.0	
32-5	Water Fountain Across from Room 209	121	
32-6	Water Fountain Across from Room 205A	227	
32-7	Water Fountain Across from Room 201	12.7	
32-8	Water Fountain Across from Room 115	25.7	
32-9	Water Fountain Across from Room 116	36.5	
32-10	Water Fountain Across from Room 126	14.4	
32-11	Water Fountain Next to Boys' Room Lobby	13.2	
32-12	Water Fountain Next to Room 136	2.99	15
32-13	Water Fountain Across from Room 101	23.9	
32-14	Water Fountain Across from Room 107	10.0	
32-15	Water Fountain Across from Room 111	66.8	
32-16	Water Fountain Next to Mechanical Room	8.81	
32-17	Water Fountain Between Rooms 124A & 124B	28.4	
32-18	Water Fountain Right of Room 124B	289	
32-19	Water Fountain Between Bathroom Next to VOC1	77.8	
32-20	SAA Bathroom Water Fountain	10.6	
32-21	Water Fountain in Gym Lobby	82.6	
32-22	Short Water Fountain in Gym Lobby (Broken- No Sample)	NA	
32-23	ROTC Water Fountain	0.792	

(μg/L) = Micrograms of lead per liter of water (parts per billion)

A review of the laboratory analytical results of the water samples collected revealed twelve samples with total lead concentrations above the EPA action level for drinking water.

Shelby County Schools Drinking Water Sampling Westwood High School September 15, 2017

## **Recommendations:**

Based upon the laboratory analytical results of the potable water samples collected from Westwood High School, Tioga recommends that the water sources above the EPA action level remain out of use.

The EPA provides technical guidance for reducing lead in drinking water in schools published in the October 2006 revision of the "3Ts for Reducing Lead in Drinking Water in Schools". Tioga recommends that a plan be developed and implemented in accordance with this guidance with additional testing to identify potential sources of lead in this school and to remediate these sources as they are identified. As the next step in determining the sources of lead contamination, Tioga recommends follow-up post-flush testing for water sources that exceeded the EPA action level.

#### Limitations

Potable water sources with elevated lead levels may potentially be present in areas of the property that are not addressed with this report. This investigation only included the potable water sources specifically addressed.

We appreciate the opportunity to provide you with this service. Should you have any questions regarding this report, please contact me at (901) 791-2432.

Sincerely,

TIOGA ENVIRONMENTAL CONSULTANTS, INC.

Eric Davis, CIE

**Environmental Scientist** 

**Enclosure:** (1) Laboratory Analytical Report



9/14/2017

Tioga Environmental Consultants Mr. Eric Davis 357 North Main Street Memphis, TN, 38103

Ref: **Analytical Testing** 

> Lab Report Number: 17-255-0248 Client Project Description: 32 All

Project #24816.01

Dear Mr. Eric Davis:

Waypoint Analytical, Inc. received sample(s) on 9/12/2017 for the analyses presented in the following report.

The above referenced project has been analyzed per your instructions. The analyses were performed in accordance with the applicable analytical method.

The analytical data has been validated using standard quality control measures performed as required by the analytical method. Quality Assurance, method validations, instrumentation maintenance and calibration for all parameters (NELAP and non-NELAP) were performed in accordance with guidelines established by the USEPA (including 40 CFR 136 Method Update Rule May 2012) and NELAC unless otherwise indicated. Any parameter for which the laboratory is not officially NELAP accredited is indicated by a '~' symbol. These are not included in the scope because NELAP accreditation is either not available or has not been applied for. Additional certifications may be held/are available for parameters, where NELAP accreditation is not required or applicable. A full list of certifications is available upon request.

Certain parameters (chlorine, pH, dissolved oxygen, sulfite...) are required to be analyzed within 15 minutes of sampling. Usually, but not always, any field parameter analyzed at the laboratory is outside of this holding time. Refer to sample analysis time for confirmation of holding time compliance.

The results are shown on the attached Report of Analysis(s). Results for solid matrices are reported on an asreceived basis unless otherwise indicated. This report shall not be reproduced except in full and relates only to the samples included in this report.

Please do not hesitate to contact me or client services if you have any questions or need additional information.

Sincerely,

Randy Thomas **Project Manager** 

Rendell H. Thomas

Laboratory's liability in any claim relating to analyses performed shall be limited to, at laboratory's option, repeating the analysis in question at laboratory's expense, or the refund of the charges paid for performance of said analysis.



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Tioga Environmental Consultants

Mr. Eric Davis

357 North Main Street Memphis , TN 38103 Project 32 All

Information: Project #24816.01

Report Date: 9/14/2017

Report Number: 17-255-0248 REPORT OF ANALYSIS Received: 9/12/2017

Lab No : 91721 Matrix: Aqueous

Sample ID: **32-1** Sampled: **9/12/2017 5:44** 

Test Results Units MQL DF Date / Time By **Analytical Analyzed** Method Total Lead 658 μg/L 0.513 1 09/13/17 21:44 BKN EPA-200.8

Lab No: 91722 Matrix: Aqueous

Sample ID: 32-2 Sampled: 9/12/2017 5:46

DF Date / Time Units MQL Test Results Ву Analytical Analyzed Method Total Lead EPA-200.8 2.53 μg/L 0.513 1 09/13/17 21:49 BKN

Lab No : 91723 Matrix: Aqueous

Sample ID: 32-3 Sampled: 9/12/2017 5:48

Test	Results	Units	MQL	DF	Date / Time Analyzed	Ву	Analytical Method	
Total Lead	9.74	μg/L	0.513	1	09/13/17 22:01	BKN	EPA-200.8	

Lab No: 91724 Matrix: Aqueous

Sampled: **9/12/2017 5:51** 

Test	Results	Units	MQL	DF	Date / Time Analyzed	Ву	Analytical Method	
Total Lead	20.0	μg/L	0.513	1	09/13/17 22:06	BKN	EPA-200.8	

Qualifiers/ Definitions DF

Dilution Factor

MQL



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Tioga Environmental Consultants

Mr. Eric Davis

357 North Main Street Memphis , TN 38103 Project 32 All

Information: Project #24816.01

Report Date: 9/14/2017

Lab No : 91725 Matrix: Aqueous

Sample ID : **32-5** Sampled: **9/12/2017 5:53** 

Test Results Units MQL DF Date / Time Bv Analytical **Analyzed** Method Total Lead 121 μg/L 0.513 1 09/13/17 22:11 BKN EPA-200.8

Lab No: 91726 Matrix: Aqueous

Sample ID : **32-6** Sampled: **9/12/2017 5:55** 

DF MQL Date / Time Test Results Units By Analytical Analyzed Method Total Lead EPA-200.8 227 μg/L 0.500 1 09/14/17 12:32 BKN

Lab No: 91727 Matrix: Aqueous

Sample ID: 32-7 Sampled: 9/12/2017 5:58

Results Units MQL DF Date / Time Analytical Test By **Analyzed** Method Total Lead EPA-200.8 12.7 μg/L 0.513 1 09/13/17 22:16 BKN

Lab No: 91728 Matrix: Aqueous

Sampled: 9/12/2017 6:02

Test	Results	Units	MQL	DF	Date / Time Analyzed	Ву	Analytical Method	
Total Lead	25.7	μg/L	0.513	1	09/13/17 22:21	BKN	EPA-200.8	

Qualifiers/ Definitions

DF

Dilution Factor

MQL



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Tioga Environmental Consultants

Mr. Eric Davis

357 North Main Street Memphis, TN 38103

Project 32 All

Information: Project #24816.01

Report Date: 9/14/2017

**REPORT OF ANALYSIS** Report Number: 17-255-0248 Received: 9/12/2017

Lab No: 91729 Matrix: Aqueous

Sample ID: 32-9 Sampled: 9/12/2017 6:04

Test Results Units MQL DF Date / Time Bv Analytical **Analyzed** Method Total Lead 36.5 μg/L 0.513 1 09/13/17 22:26 BKN EPA-200.8

Lab No: 91730 Matrix: Aqueous

Sample ID: 32-10 Sampled: 9/12/2017 6:07

DF MQL Date / Time Test Results Units By Analytical Analyzed Method Total Lead EPA-200.8

0.500

Lab No: 91731 Matrix: Aqueous

μg/L

14.4

Sample ID: 32-11 Sampled: 9/12/2017 6:16

Results Units MQL DF Date / Time Analytical Test By **Analyzed** Method Total Lead EPA-200.8 13.2 μg/L 0.500 1 09/14/17 12:42 BKN

Lab No: 91732 Matrix: Aqueous

Sampled: 9/12/2017 6:17 Sample ID : **32-12** 

Test	Results	Units	MQL	DF	Date / Time Analyzed	Ву	Analytical Method	
Total Lead	2.99	μg/L	0.513	1	09/13/17 22:30	BKN	EPA-200.8	

Qualifiers/ **Definitions**  DF

Dilution Factor

MQL

Method Quantitation Limit

1 09/14/17 12:37 BKN



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Tioga Environmental Consultants

Mr. Eric Davis

357 North Main Street Memphis, TN 38103 Project 32 All

Information: Project #24816.01

Report Date: 9/14/2017

Report Number: 17-255-0248 REPORT OF ANALYSIS Received: 9/12/2017

Lab No: 91733 Matrix: Aqueous

Sample ID: **32-13** Sampled: **9/12/2017 6:20** 

Test Results Units MQL DF Date / Time By **Analytical Analyzed** Method Total Lead 23.9 μg/L 0.513 1 09/13/17 22:35 BKN EPA-200.8

Lab No : 91734 Matrix: Aqueous

Sample ID: 32-14 Sampled: 9/12/2017 6:22

DF Date / Time Units MQL Test Results Ву Analytical Analyzed Method Total Lead EPA-200.8 10.0 μg/L 0.513 1 09/13/17 23:12 BKN

Lab No : 91735 Matrix: Aqueous

Sample ID: **32-15** Sampled: **9/12/2017 6:23** 

Test	Results	Units	MQL	DF	Date / Time Analyzed	Ву	Analytical Method
Total Lead	66.8	μg/L	0.500	1	09/14/17 12:47	BKN	EPA-200.8

Lab No: 91736 Matrix: Aqueous

Sampled: **9/12/2017 6:25** 

Test	Results	Units	MQL	DF	Date / Time Analyzed	Ву	Analytical Method	
Total Lead	8.81	μg/L	0.513	1	09/13/17 23:17	BKN	EPA-200.8	

Qualifiers/ Definitions DF

Dilution Factor

MQL



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Tioga Environmental Consultants

Mr. Eric Davis

357 North Main Street Memphis , TN 38103 Project 32 All

Information: Project #24816.01

Report Date: 9/14/2017

Report Number: 17-255-0248 REPORT OF ANALYSIS Received: 9/12/2017

Lab No : 91737 Matrix: Aqueous

Sample ID : **32-17** Sampled: **9/12/2017 6:27** 

Test Results Units MQL DF Date / Time Bv Analytical **Analyzed** Method Total Lead 28.4 μg/L 0.513 1 09/13/17 23:22 BKN EPA-200.8

Lab No: 91738 Matrix: Aqueous

Sample ID : **32-18** Sampled: **9/12/2017 6:30** 

DF MQL Date / Time Test Results Units By Analytical Analyzed Method Total Lead EPA-200.8 289 μg/L 0.513 1 09/13/17 23:27 BKN

Lab No : 91739 Matrix: Aqueous

Sample ID: **32-19** Sampled: **9/12/2017 6:34** 

Results Units MQL DF Date / Time Analytical Test By **Analyzed** Method Total Lead EPA-200.8 77.8 μg/L 0.500 1 09/14/17 12:52 BKN

Lab No: 91740 Matrix: Aqueous

Sampled: 9/12/2017 6:35

Test	Results	Units	MQL	DF	Date / Time Analyzed	Ву	Analytical Method	
Total Lead	10.6	μg/L	0.500	1	09/14/17 12:57	BKN	EPA-200.8	

Qualifiers/ Definitions DF

Dilution Factor

MQL



06510

Tioga Environmental Consultants

Mr. Eric Davis

357 North Main Street Memphis , TN 38103 Project 32 All

Information: Project #24816.01

Report Date: 9/14/2017

Lab No : 91741 Matrix: Aqueous

Sample ID : **32-21** Sampled: **9/12/2017 6:41** 

Test	Results	Units	MQL	DF	Date / Time Analyzed	Ву	Analytical Method
Total Lead	82.6	μg/L	0.500	1	09/14/17 13:02	BKN	EPA-200.8

Lab No: 91742 Matrix: Aqueous

Sample ID: 32-23 Sampled: 9/12/2017 6:52

Test	Results	Units	MQL	DF	Date / Time Analyzed	Ву	Analytical Method
Total Lead	0.792	μg/L	0.513	1	09/13/17 23:32	BKN	EPA-200.8

Qualifiers/ Definitions DF

Dilution Factor

MQL



# **Cooler Receipt Form**

Customer Number: 06510

Customer Name: Tioga Environmental Consultants

Report Number: 17-255-0248

## **Shipping Method**

			•			
○ Fed Ex	○ US Postal	◯ Lab		Other:		
UPS	Client	O Couri	er	Thermometer ID:	NA	
Shipping contain	er/cooler uncomprom	ised?	Yes	○ No		
Number of coole	rs received		1			
Custody seals int	tact on shipping conta	ainer/cooler?	O Yes	○ No	● No	ot Required
Custody seals int	tact on sample bottles	O Yes	○ No	● No	ot Required	
Chain of Custody	(COC) present?		Yes	○ No		
COC agrees with	sample label(s)?		Yes	○ No		
COC properly co	mpleted		Yes	○ No		
Samples in prope	er containers?		Yes	○ No		
Sample containe	rs intact?		Yes	○ No		
Sufficient sample	volume for indicated	test(s)?	Yes	○ No		
All samples recei	ived within holding tin	ne?	Yes	○ No		
Cooler temperatu	ure in compliance?		Yes	○ No		
	arrived at the laboratonsidered acceptable un.		○ Yes	● No		
Water - Sample of	containers properly pr	reserved	Yes	○ No	○ N/	′A
Water - VOA vial	s free of headspace		O Yes	○ No	● N	′A
Trip Blanks recei	ved with VOAs		O Yes	○ No	● N	'A
Soil VOA method	I 5035 – compliance of	criteria met	O Yes	○ No	● N/	A
High concent	ration container (48 h	r)	Lov	w concentration EnC	ore sample	ers (48 hr)
High concentr	ration pre-weighed (m	ethanol -14 d	)	w conc pre-weighed	vials (Sod	Bis -14 d)
Special precaution	ons or instructions inc	luded?	O Yes	No		
Comments:						

Signature: Danyale Love Date & Time: 09/12/2017 13:47:39



Kit ID: Initiated By: **Andy Parrish** Initiated Date: 9/8/2017 **Project Comment** 

CHAIN-OF-CUSTODY



Tioga Environmental Consultants

06510 09-12-2017 13:46:41

Company N		Company Numb	er	Client F	ic	Nanager/Contact	Purchase (	Order Number
Site Name	All ct ID	Project Number	Project Manager Phone #			ctional charges apply ction Limits(s) eded er Email Com	Fed Ex Courier Other Site/Facili	Ceffent Drop Off
Date	Time	Sample ID	Matrix	Grab/ Comp	# of Cont	Container Type	Preservation	Analyses
9/12/17	0544	32-1	Aqueous	6	1	Plastic - Pint	NONE	Total Lead/DW
9/12/17	0546	32-2	Aqueous	6	1	Plastic - Pint	NONE	Total Lead/DW
9/12/17	0548	32-3	Aqueous	6	1	Plastic - Pint	NONE	Total Lead/DW
9/12/17	0551	32-4	Aqueous	6	1	Plastic - Pint	NONE	Total Lead/DW
9/12/17	0553	32-5	Aqueous	6	1	Plastic - Pint	NONE	Total Lead/DW
9/12/17	0555	32-le	Aqueous	6	1	Plastic - Pint	NONE	Total Lead/DW
9/12/17	0558	32-7	Aqueous	6	1	Plastic - Pint	NONE	Total Lead/DW
9/12/17	0602	32-8	Aqueous	6	1	Plastic - Pint	NONE	Total Lead/DW
							. 1	

For Laboratory Use Only			Sampled by (Name - Print)	Client	Client Remarks/Comments				
Ice	Custody	Lab Comments	MAC		1-	NE INTI			
	Seals		Relinquished by: (SIGNATURE)	Date	Time	Received by: (SIGNATURE)	Date	Time	
YN	Y/N		9	1(4)7	1231	e			
			Relinquished by: (SIGNATURE)	Date	Time	Received by: (SIGNATURE)	Date	Time	
Blank/Co	ooler Temp		Relinquished by: (SIGNATURE)	Date	Time	Received by: (SIGNATURE)	Date/(	Fime 21	
						aroe Dune	12	:3(	



Kit ID:	0000085992	
Initiated By:	Andy Parrish	
Initiated Date:	9/8/2017	
Project Comme	ent	

CHAIN-OF-CUST(



17-255-0248 06510 09-12-2017 13:46:41

Company Name  Tioga Environmental Consultants  Site Name  32 - 4 \ \ \  LIMS Project ID		Company Number				Manager/Contact	Purchase	Purchase Order Number		
		Project Number	Project Manager Phone #		cial Dete	er Email Loga	Fed Ex Courier Other Site/Facili	Courier Client Drop Off Other  Site/Facility ID #		
Date	Time	Time Sample ID		Grab/ Comp	# of Cont	Container Type	Preservation	Analyses		
9/12/17	0604	32-9	Aqueous	G	1	Plastic - Pint	NONE	Total Lead/DW		
9/12/17	0607	32-10	Aqueous	6	1	Plastic - Pint	NONE	Total Lead/DW		
9/12/17	0616	32-11	Aqueous	6	1	Plastic - Pint	NONE	Total Lead/DW		
9/12/17	0617	32-12	Aqueous	6	1	Plastic - Pint	NONE	Total Lead/DW		
9/12/17	0620	32-13	Aqueous	6	1	Plastic - Pint	NONE	Total Lead/DW		
9/12/17	0622	32-14	Aqueous	6	1	Plastic - Pint	NONE	Total Lead/DW		
	0623	32-15	Aqueous	6	1	Plastic - Pint	NONE	Total Lead/DW		
9/12/17	0025	32-16	Aqueous	6	1	Plastic - Pint	NONE	Total Lead/DW		

For Laboratory Use Only			Sampled by (Name - Print)	Client Remarks/Comments					
Ice Custody		Lab Comments	MALC	CT VS IAI					
	Seals		Relinquished by: (SIGNATURE)	Date	Time	Received by: (SIGNATURE)	Date Time		
YN	Y/N		11/1 9	12/17	1234				
	M		Relinquished by: (SIGNATURE)	Date	Time	Received by: (SIGNATURE)	Date Time		
Blank/Co	oler Temp				-				
			Relinquished by: (SIGNATURE)	Date	Time	Received by: (SIGNATURE)	Opte 2Time		
	200					Carpe Dunly	12:3		



LH

2790 Whitten Road, Memphis, TN 38133 Main 901.213.2400 ° Fax 901.213.2440 www.waypointanalytical.com

Kit ID:	0000085992	
Initiated By:	Andy Parrish	
Initiated Date:	9/8/2017	
Project Comme	ent	

**CHAIN-OF-CUSTODY** 



06510 09-12-2017 13:46:41

Company Name  Tioga Environmental Consultants  Site Name  32-411		Company Number	Mr. Luke	vic	Davis		Purcnase C	order Number		
		Project Number  24816-01				tional charges apply ction Limits(s)	Method of Shipment  Fed Ex UPS USPS Courier Client Drop Off Other			
LIMS Projec	ct ID		Project Manager Pho (901) 791-2432	one #	1	aul	er Email S & thogae	NJ,	Site/Facilit	ty ID#
Date	Time		Sample ID	Matrix	Grab/ Comp	# of Cont	Container Type	Pres	servation	Analyses
9/12/17	0627	W.	32-17	Aqueous	6	1	Plastic - Pint	1	NONE	Total Lead/DW
9/12/17	0630		32-18	Aqueous	6	1	Plastic - Pint	1	NONE	Total Lead/DW
9/12/17	0634		32-19	Aqueous	6	1	Plastic - Pint	1	NONE	Total Lead/DW
4/12/17	0635		32-20	Aqueous	6	1	Plastic - Pint	1	NONE	Total Lead/DW
4/12/17	0641		32-21	Aqueous	6	1	Plastic - Pint	ı	NONE	Total Lead/DW
9/12/17	०७५५	LH	32-22	Aqueous	6	_1_	Plastic - Pint		NONE	Total Lead/DW
7/12/17	0652		32-23	Aqueous	6	1	Plastic - Pint		NONE	Total Lead/DW
9/12/17			L	Aqueous	6	1	Plastic - Pint		NONE	Total Lead/DW

For Laboratory Use Only			Sampled by (Name - Print)	Client Remarks/Comments						
Ice Custody		Lab Comments	HALA CC	C9 N5 141						
	Seals		Relinquished by: (SIGNATURE)	Date	Time	Received by: (SIGNATURE)	Pate.	Time		
YN	Y/N		Then of	12/17	123	Carol Dunlo	12	2:30		
			Relinquished by: (SIGNATURE)	Date	Time	Received by: (SIGNATURE)	Date	Time		
Blank/Co	oler Temp									
			Relinquished by: (SIGNATURE)	Date	Time	Received by: (SIGNATURE)	Date	Time		
-										